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Thermoplastic polyamide molding material with improved flow, used for production of fibres, film or moldings, contains a branched homo- or co-polymer obtained from a 2-3'-hydroxyphenyl-oxazoline compound

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Addnl. Data: GRUTKE S, GRUBER F, VOIT B, HUBER T

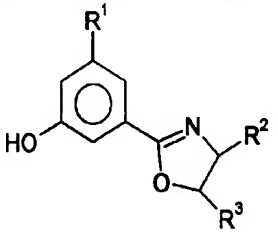
A(5-F1B1, 8-M, 12-E1, 12-S5K, 12-T2, 12-T4)

NOVELTY

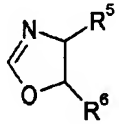
Thermoplastic molding materials containing:
(A) 39-99.95 wt% thermoplastic polyamide;
(B) 0.05-9 wt% branched homo- or co-polymer obtained by polymerisation of a 2-(3-hydroxyphenyl)-oxazoline compound; and
(C) 0-60 wt% other additives.

DETAILED DESCRIPTION

Thermoplastic molding materials containing:
(A) 39-99.95 wt% thermoplastic polyamide;
(B) 0.05-9 wt% branched homo- or co-polymer obtained by polymerisation of monomers of formula (I); and
(C) 0-60 wt% other additives.



(I)



(II)

R^1 = H, $COOR^4$, OH or a group of formula (II);
R^2, R^3 = H, methyl, ethyl, benzyl or phenyl, with the proviso that at least one of these groups is H;
R^4 = H or 1-4C alkyl;
R^5, R^6 = as for R^2, R^3

An INDEPENDENT CLAIM is also included for molded products

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obtained from these materials.

USE

For the production of fibres, film and molded products (claimed). Preferred applications are in electrical products, electronics and motor vehicles.

ADVANTAGE

The addition of branched polymers derived from 2-(3-hydroxy-phenyl)-oxazoline compounds gives polyamide-based molding materials with good flow properties combined with good mechanical properties and good melt- and processing-stability.

SPECIFIC COMPOUNDS

(A) is polyamide 6.

EXAMPLE

2-(3,5-dihydroxyphenyl)-oxazoline (3.3 g) was polymerized by heating the melt for 1.5 hours at 220 °C and then working up by dissolution in dimethyl sulfoxide (5 ml) followed by precipitation with water or methanol. The product (P2; 2.8 g; 84%) showed a degree of branching of 59% (by ^{1}H-NMR analysis), mol. wts. (by GPC) of Mn = 21600 and Mw = 51000 with a mol. wt. distribution of 2.3, a glass transition point of 175 °C and an inherent viscosity (DMF; 30 °C) of 0.119 dl/g. Polyamide 6 with equal numbers of acid and amino end groups (B56) was compounded for 5 minutes at 250 °C with 10 wt% P2. The product (B56-P2-10) showed a melting point of 221.0 (222.6) °C, a heat of fusion of 67.5 (74.2) J/g, a crystallisation onset temperature of 190.8 (192.7) °C, a heat of crystallisation of -65.0 (-74.9) J/g, a glass transition point of 73 (52-54) °C, a heat capacity of 0.22 (0.12) J/g/K, a complex viscosity of 412 (845) at 250 °C and 1 rad/s, a solution viscosity (0.5 % in sulfuric acid at 25/ °C) of 152 (174) and a tensile modulus (press-molded at 240 °C) of 1.99 (1.92) GPa. Values in brackets are for the unmodified polyamide 6.

DEFINITIONS

Preferred Definitions: R^1 = OH; R^2 = R^3 = H.

TECHNOLOGY FOCUS

Polymers - Preferred Components: Component (A) shows a COOH to NH_2 end group ratio of more than 1. Component (B) has a degree of branching of at least 10% and a number-average mol. wt. (Mn) of at least 5000.

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